

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 007180-5	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US03/09858	International filing date (day/month/year) 31 MARCH 2003	(Earliest) Priority Date (day/month/year) 29 MARCH 2002
Applicant THE UNIVERSITY OF UTAH RESEARCH FOUNDATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

The methods and compositions disclose synthesis of a novel class of "two-headed" phospholipid-phosphoinositide hybrids possessing a carbon backbone, such as 2,3-diacylthreitol, erythritol or a synthetic module. The second phospholipid head group allows introduction of a biochemical or chemical moiety in a position orthogonal in space to those occupied by the phosphoinositide head group and the two acyl chains. The diacyl moieties allow for the incorporation of Pea-PIP2 into a lipid bilayer, while the PtdIns(4,5)P2 moiety in the aqueous layer is specifically recognized by lipid binding proteins. In alternative embodiments of the invention, reporters, for example biotin, fluorophores and/or spin labels, are attached to the free amino group of the head groups of such molecules to specifically target the reporters to the lipid-water interface. Figure (1) illustrates (at c) an exemplary hybrid lipid of the present invention that possess a phosphatidylethanolamine (PE, or Pea) head group at the 1-position and a PtdIns(4,5)P2 head group at the 4-position.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/09858**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C12Q 1/00, 1/42, 1/48; G01N 33/53

US CL : 435/4, 21, 7.1, 15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/4, 21, 7.1, 15

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Non-Patent LiteratureElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST:phosphatidylinositol polyphosphate, carbon backbone, phosphatidylethanolamine, phosphatidylinositides head group, phosphoinositider-specific protein binding method**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20020028477 A1 (GOUELI et al) 07 March 2002, see entire document.	1-33
A/P	US 20030100028 A1 (DREES et al) 29 May 2003, see entire document.	1-33

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

• Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

23 NOVEMBER 2003

Date of mailing of the international search report

06 FEB 2004

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks

Authorized officer

BEST AVAILABLE COPY